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## **RAISING THE BAR OF PERFORMANCE IN THE FAA: APPLYING A SYSTEMS THINKING APPROACH**

### **ABSTRACT**

Organizations are complex networks of inputs, processes, outputs, and feedback from customers, suppliers, and employees. Management needs a set of concepts and tools for aligning those components for improving quality and service, reducing time and costs, and implementing strategies. Training managers in the principles of systems thinking allows them to break free of the older bureaucratic approach to organization planning and management. A systems thinking mindset is necessary to effectively manage complex organizational networks.

This article uses the FAA experience to demonstrate how one organization is applying the skills and knowledge available in management training to meet the demands of the 21<sup>st</sup> Century, in which organizations must raise the “bar of performance” to remain viable.

### **PREPARING FOR THE FUTURE**

In 1993, President Clinton asked Vice President Gore to make government work better and cost less. The Federal Aviation Administration (FAA) is doing just that—improving service and response to the American public. The FAA’s mission is very complex. There

are 110,000 takeoffs and landings and 55,000 enroute operations that occur daily in addition to 1.6 million passenger enplanements every day. While FAA successfully focuses on its daily operations, it also guides dramatic changes in the nation’s aviation system. Increased operational demand, the diversity of aircraft, changing technology, and the globalization of the airline industry will challenge the FAA to maximize safety, while increasing the capacity and efficiency of the National Airspace System (NAS).

### **New Opportunities**

In 1996, Congress authorized the FAA to reform both its Acquisition Management System and Personnel Management System to help the FAA meet these challenges, especially NAS Modernization. The acquisition reform goal was to establish efficient processes and remove barriers to ensure that FAA’s acquisition management system supported rapid and efficient delivery of high quality products and services to FAA customers. Targets of the new acquisition management system were to strive for a 50 percent reduction in acquisition cycle time and a 20 percent reduction in acquisition costs.

The personnel reform goal was to

develop and implement a dramatically improved Personnel Management System, to include staffing, compensation, performance management, training and other human resources functions. The purpose was to give managers and employees the tools necessary to work more efficiently and effectively in FAA's changing environment.

A Blue Ribbon Panel on acquisition reform recommended the rapid design and implementation of a new Personnel Management System to support the transition of the workforce. They stated that acquisition reform was necessary but insufficient to accelerate NAS modernization. Changes in the organization's human resource infrastructure (i.e., hiring, rewarding, education and training, and pay systems) were needed to provide strong incentives to "raise the bar of performance", to make needed improvements in the way FAA does business, and to transform the FAA acquisition community into a culture of excellence.

In addition to these new strategies for supporting the FAA's ability to meet the challenges of the future, FAA remained committed to continued implementation of the Integrated Product Development System (IPDS). The IPDS uses cross-functional Integrated Product Teams from across the FAA to speed the delivery of products and services that satisfy customer requirements. The bottom-line goal of these initiatives is to have a results-based organization and to have a workforce with the appropriate skill level and skill mix to meet the challenges of the 21<sup>st</sup> Century.

## SYSTEMS THINKING-SEE AN ORGANIZATION ANEW

Organizations are complex networks of inputs, processes, outputs, and feedback from customers, suppliers, and employees. Management therefore needs a set of concepts and tools for aligning those components for improving quality and service, reducing time and costs, and implementing strategies. Training managers in the principles of systems thinking is essential to their effectiveness in managing complex organizational networks.

The FAA Center for Management Development offers a highly successful Systems Thinking course. In the course reference book, The Fifth Discipline, Peter Senge describes systems thinking as a discipline for seeing wholes. It is a framework for seeing patterns and interrelationships rather than things, static events, or snapshots. Systems thinking encourages the application of dynamic strategies to daily activities, suggestions, concerns, and organizational change, rather than using linear, cause and effect approaches. Complexity can overwhelm and undermine. By seeing the patterns that lie behind events and details, life can be simplified. Systems thinking makes these realities more manageable.

### Definitions

- A System is a set of components that work together for the overall objective of the whole (output)
- Systems thinking is a mindset or a way to view what we see in the

world; a worldview and way of thinking whereby we see the entity or unit first as a whole, with its fit and relationship to its environment as primary concerns; the parts secondary.<sup>1</sup>

#### Characteristics of a System

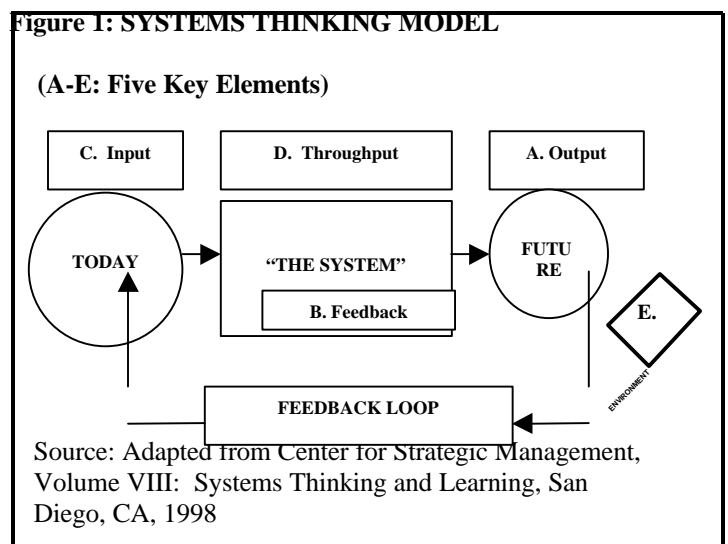
- The performance of a whole is affected by every one of its parts.
- The way that any part affects the whole depends on what at least one other part is doing –i.e., one part of the system has an independent effect on the whole.
- If you take these parts and group them in any way, they form subgroups which are subject to the same first and second characteristics.
- A system is an indivisible whole.<sup>2</sup>

System thinking comes from a rigorous scientific discipline called General System Theory, which developed from the study of biology in the 1920s. The system approach builds on the principle that organizations, like organisms, are “open” to their environment and must achieve an appropriate relation with that environment to survive.<sup>3</sup>

Within an open system approach organizations are defined in terms of interrelated subsystems. In other words, it is the intra-and interorganizational relations, patterns, and interconnections that form the operations of the organization. Establishing congruencies between the different systems and subsystems and eliminating potential dysfunction is key.<sup>4</sup>

Classical management theory devoted little attention to how an organization operates within its environment. It is systems thinking’s different mindset that allows us to break free of the older bureaucratic approach to organization planning and management and to organize in a way that meets the requirements of the environment. As confirmed by many organizational experts, there is no one best way to organize. The appropriate way depends on the kind of tasks or environment within which the organization must operate.

Thinking in terms of outputs, feedback, inputs, and throughputs and how they relate to the environment provides an effective way to view systems. The model shown at Figure 1 elucidates a systems thinking framework.



To support the model five questions are asked:

- Where do we want to be? (i.e., our ends, outcomes, purposes, goals, holistic vision)

- B. How will we know when we get there? (i.e., the customers' needs)
- C. Where are we now? (i.e., today's issues and problems)
- D. How do we get there? (i.e., close the gap from C to A in a complete holistic way)
- E. What will/may change in the environment in the future? (Ongoing)<sup>5</sup>

### SYSTEMS THINKING: FROM THEORY TO PRACTICE

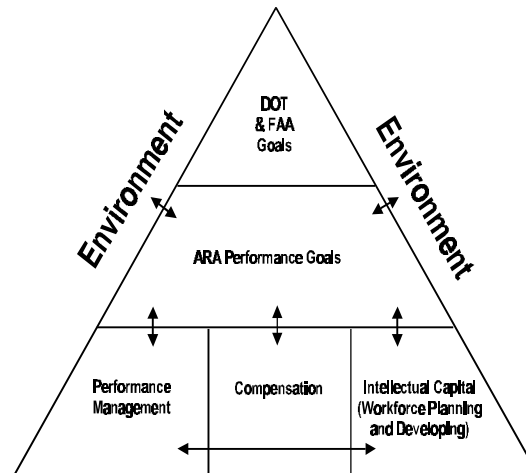
The Office of Research and Acquisitions (ARA) is the FAA line of business entrusted with the primary responsibility of ensuring that the FAA has the research and technology base to provide a safe, secure, and efficient NAS. To help prepare for the changes in the next decade, the ARA Management Team was challenged to take advantage of the new reform opportunities.

#### Let the Journey Begin

Just as there was a requirement for a NAS Architecture to guide NAS modernization, an architecture was needed to guide the design of personnel reform. The ARA Management Team used an open systems approach to build the architecture. They recognized that ARA is only one part of the larger FAA organization, and based on its mission, has countless interdependencies with other FAA organizations, external and internal customers, and stakeholders. The ARA conceptual framework of the personnel reform architecture is shown at Figure 2.

and wants connected into a quantifiable feedback system)

**Figure 2:**  
**ARA Personnel Reform Framework**



As depicted in the framework, key interdependent areas were identified as necessary to position ARA for the future:

- Performance Management System, for both the Organization and Employees
- Compensation
- Intellectual Capital (Workforce Planning and Development)

Guideposts to lead the journey towards success were identified during the processes of building the architecture. These guidepost were:

- ARA would be a high performance organization.
- Measurable strategic goals would set priorities for the next 3-5 years.
- The new personal management system would be an integral part of the organization's business processes to achieve organizational outcomes.

- Intellectual capital would be recognized as a strategic asset.
- Managers would have to increase management and leadership responsibilities and accountability.
- Recognition that a change in one component of a key area impacts other areas.

To being the journey, using the Open Systems Model as a backdrop as depicted in Figure 1, three questions were asked simultaneously: (1) Where do we want to be (Element A)? (2) Where are we now (Element C)? and (3) What will/may change in the environment in the future (Element E)?

ARA conducted an extensive environmental scan to help determine its outcomes, goals, and direction for the future, to help baseline its current state, and to understand its relation with the environment. This scan gathered input from internal and external customers, stakeholders, and employees. Among the source documents reviewed were:

- FAA Strategic Plan;
- White House Commission on Safety and Security;
- General Accounting Office audit reports;
- The latest version of the NAS Architecture;
- Documents describing the future concept of operations for Air Traffic;
- Challenge 2000 documents that outline the drivers and concepts of future operations and the business plan;
- Business plans of other FAA organizations; and

- ARA Culture Surveys Results from current and previous years.

In 1997, the ARA Management Team created the first Performance Plan using its vision and mission statements and environmental scan input. The Plan contained 15 measurable goals representing ARA's priorities through Fiscal Year 1999. The goals provided performance targets to guide the organization through 2007. The efforts of ARA's workforce and allocation of its fiscal resources would be directed toward accomplishing the goals described in the Performance Plan.<sup>6</sup>

The question, "How do we get there (Element D)? is answered by the Performance Plan. The plan outlined for each goal general strategies ARA would follow to accomplish each goal. In addition, each goal had performance indicators by which ARA would measure its progress. Detailed implementation plans for each goal were developed to ensure implementation with feedback processes to monitor progress.

ARA's goals supported and aligned with the FAA Strategic Plan and the Administrator's Performance Plan. Using the personnel reform architecture to guide development and the Performance Plan as the compass to guide direction, ARA began developing key areas of personnel reform: the Performance Management Program for Employees, Compensation, and Intellectual Capital.

#### Performance Management Program for Employees

The existing performance management

program for individual employees was pass/fail based on the accomplishment of activities and vague standards. The new performance management program was a strategy to encourage high levels of performance by focusing on achieving measurable results linked to the organization's goals. The program provided for supervisors and employees to work together more closely to prepare individual performance plans and establish the criteria for assessing performance. Equally important, supervisors and employees worked together to map out employees' career goals. These goals were designed to promote individual growth and to meet projected corporate needs. The new performance management program and the new core compensation plan combined to pay employees for performance and reward results.

#### Compensation

The current Federal-wide compensation system served FAA for many years but was not flexible enough to fully meet the FAA's unique needs. The design of the FAA's new compensation system combined best practices of compensation systems in the public and private sectors. The framework was designed to meet several objectives:

- Recognizing the value each employee brings to the organization;
- Stressing the importance of productivity; and
- Encouraging the development of intellectual capital (realizing that employees are our greatest assets).

Overall, the FAA needed a compensation system to ensure that we

could attract and retain high performing employees by providing more competitive compensation levels and by recognizing employees who contribute significantly to achieving organizational goals.

ARA is piloting the new core compensation plan for the FAA. The new plan has 12 broad pay bands with no steps

as compared to the previous system with 15 pay grades with 10 steps.

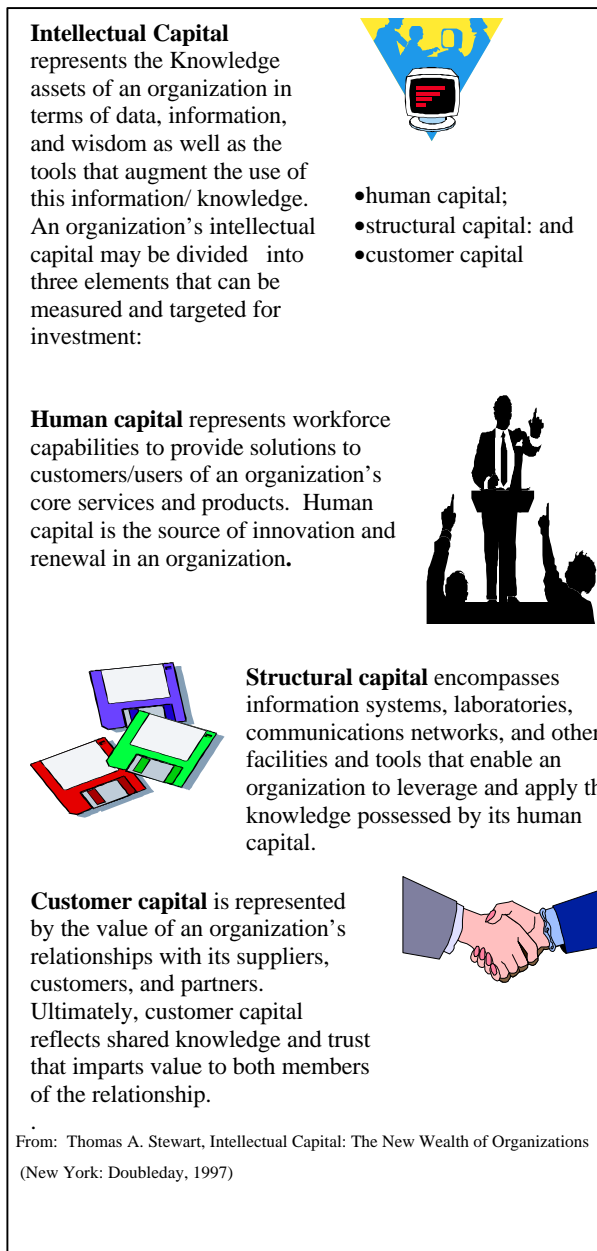
To ensure base pay levels are competitive, the FAA uses market pay data to establish each pay band. The primary labor market for the FAA is the aviation and airline industry. The new core compensation plan eliminated tenure and most entitlements for pay increases. Instead, it pays for performance and results by providing base pay increases tied to successfully meeting the organization's annual performance plan goals. In addition, the new pay plan provides base pay increases to employees who provide superior contributions to the organization. The new performance management program provided the criteria for assessing individual performance and the new core compensation plan spelled out how to compensate individuals for their performance.<sup>7</sup>

#### Intellectual Capital (Workforce Planning and Development)

An Intellectual Capital Investment Planning (ICIP) process was initiated to provide direction and decisions needed to guide ARA workforce transition. As noted in Figure 3, an

organization's intellectual capital includes human capital, structural capital, and customer capital components. The ICIP council, comprised of ARA executive level leaders (a subgroup of executives who created the Performance Plan) developed the ICIP to provide a framework for assessing current and future human capital needs and identifying ARA's human capital investment priorities. The ICIP recognized the need to focus attention on human capital planning (people resources) as it had focused attention on its structural capital (the NAS Capital Investment Plan), and customer capital (planning and strategy documents related to the Integrated Product Development System).

**Figure 3: Intellectual Capital**



- Collect baseline data on current utilisation and capabilities of the workforce;
- Identify future workforce workload and competency requirements; and
- Establish investment priorities to support the required workforce changes.

By using environmental scan inputs, nine “high drivers” were identified that would have significant impact on the workload and competency requirements for many of the roles performed by the ARA workforce and would change the workforce environment between 1997 and 2005. A systematic evaluation of how the high drivers would impact each role performed by the ARA workforce was conducted. Next, a gap analysis was conducted in terms of the number of people required to perform various roles or to change competency requirements in order to perform each role. The ICIP Council identified alternatives for resolving these gaps (e.g., training on new competencies, change in hiring patterns, outsourcing, etc.). As the planning process matures, the ICIP Council will be able to ensure the ARA workforce is prepared for the future.<sup>8</sup>

To support the development of human capital, The Acquisition Workforce Learning System (AWLS) was designed as an integrated set of programs and methods to provide the means to develop the workforce in ways to achieve the ARA Performance Plan goals. The objectives of the AWLS are to:

Overall, the ICIP Council worked to:

- Develop a systematic workforce planning process;
- Identify the roles and activities currently performed by the workforce;
- Develop competency models to assess the workforce capabilities and
- existing developmental requirements for each role;

- Move beyond the narrow perspective of training and education to a system of continuous learning in the workforce;
- Provide learning activities that are directly related to accomplishing the



## ARA Performance Plan; and

- Strengthen the organization's mission-related competencies that are forecasted as critical for the future.

Overall, the objective of workforce planning and development is to improve the organization's performance. This is accomplished by identifying current and future workforce workload and competency requirements; determining the gaps; and establishing investment priorities to support the required workforce changes.

### Monitoring the Journey

The open systems model asked the question, "How will we know when we get there ((i.e., close the gap) Element B)?" To answer that question ARA set into motion several ways to collect feedback data on how well the system was operating and to get feedback from the environment. One monitoring method was the formal process by which the ARA Management Team assessed whether the performance goals were achieved each fiscal year. The output of this assessment process was one indicator for determining whether ARA employees received an Organizational Success Increase to their base pay under the new performance-based compensation plan. To ensure employees stayed informed and to enable them to monitor the organization's progress toward meeting its goals, a written quarterly report was provided to all employees.

A quantifiable formal evaluation process was used to determine the achievements in and results of the key personnel reform areas. This

process, tracking the progress of the implementation and collecting data that could be used to make mid-course corrections to any area, always remembering to recognize that any change in one component of the system impacts the other parts of the system.

## CONCLUSION

Flexibilities granted by personnel reform allowed the FAA and ARA to make changes in its overall systems approach in order to raise the "bar of performance." Using a systems thinking mindset permitted the ARA Management Team to begin positioning the organization to meet its challenges and to take advantage of the new opportunities granted by Congress. The bottom line goal of these initiatives is a results-based organization and a highly skilled workforce capable of meeting the challenges of the 21<sup>st</sup> Century. Through management training courses like systems thinking and successful application of its principles, the FAA will achieve its goal—improving service and response to the public.

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